

FILE 'CAPLUS' ENTERED AT 14:45:52 ON 21 SEP 2001
L1 2 S NAKAGAWA?/IN AND KITANO?/IN AND BLOCK
L2 1 S WO9955751/PN

FILE 'DPCI' ENTERED AT 14:48:25 ON 21 SEP 2001
L3 1 S WO9955751/PN

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L3 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2001 ACS
 AN 1998:814226 CAPLUS
 DN 130:154029
 TI Atom Transfer Radical Polymerization of Poly(vinyl ether) Macromonomers
 AU Yamada, Kenji; Miyazaki, Masayuki; Ohno, Kohji; Fukuda, Takeshi;
 Minoda, Masahiko
 CS Institute for Chemical Research, Kyoto University, Uji Kyoto, 611, Japan
 SO Macromolecules (1999), 32(2), 290-293
 CODEN: MAMOBX; ISSN: 0024-9297
 PB American Chemical Society
 DT Journal
 LA English
 CC 35-4 (Chemistry of Synthetic High Polymers)
 AB The atom transfer radical polymn. (ATRP) of vinyl ether
 (VE)-based macromonomers with a methacryloyl group at the chain end is
 studied. Living cationic polymn. of iso-Bu vinyl ether (IBVE) initiated
 with the HCl adduct of a VE carrying a pendant methacryloyl group in
 conjunction with ZnI₂ yielded the macromonomer (MA-PIBVE) with a narrow
 mol. wt. distribution (MWD) (.hivin.Mw/.hivin.Mn < 1.1). The ATRP
 of MA-PIBVE was carried out using a halide initiator and the
 CuBr/4,4'-di-n-heptyl-2,2'-bipyridine catalytic system. The no.-av. mol.
 wt. of the polymacromonomer increased in proportion to the monomer
 conversion, while the MWDs stayed fairly narrow (.hivin.Mw/.hivin.Mn
 .apprx. 1.2). Thus a novel type of polymacromonomers with controlled
 chain lengths for both the backbone and the side chain have been
 synthesized through a combination of living cationic polymn. and
 ATRP techniques.
 ST macromonomer isobutyl vinyl ether polymn; cationic living polymn isobutyl
 vinyl ether; atom transfer radical polymn macromonomer
 IT Polymerization
 (atom transfer radical; combined use of living cationic polymn. and
 atom transfer radical polymn. in synthesis of iso-Bu vinyl ether-based
 macromonomers and their well-defined polymacromonomers)
 IT Living polymerization
 (cationic; combined use of living cationic polymn. and atom transfer
 radical polymn. in synthesis of iso-Bu vinyl ether-based macromonomers
 and their well-defined polymacromonomers)
 IT Macromonomers
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic
 preparation); PREP (Preparation); PROC (Process)
 (in combined use of living cationic polymn. and atom transfer radical
 polymn. in synthesis of iso-Bu vinyl ether-based macromonomers and
 their well-defined polymacromonomers)
 IT Cationic polymerization
 (living; combined use of living cationic polymn. and atom transfer
 radical polymn. in synthesis of iso-Bu vinyl ether-based macromonomers
 and their well-defined polymacromonomers)
 IT 9003-44-5DP, Isobutyl vinyl ether homopolymer, methacryloyl-terminated,
 polymers
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (combined use of living cationic polymn. and atom transfer radical
 polymn. in synthesis of iso-Bu vinyl ether-based macromonomers and
 their well-defined polymacromonomers)
 IT 153472-39-0
 RL: CAT (Catalyst use); USES (Uses)
 (polymn. catalyst; combined use of living cationic polymn. and atom
 transfer radical polymn. in synthesis of iso-Bu vinyl ether-based
 macromonomers and their well-defined polymacromonomers)
 IT 10139-47-6, Zinc iodide 11129-27-4, Copper bromide 71071-44-8,
 4,4'-Di-n-heptyl-2,2'-bipyridine
 RL: CAT (Catalyst use); USES (Uses)
 (polymn. catalyst; in combined use of living cationic polymn. and atom
 transfer radical polymn. in synthesis of iso-Bu vinyl ether-based
 macromonomers and their well-defined polymacromonomers)

RE.CNT 60

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AN 1997:51149 CAPLUS

DN 126:186508

TI **Living free radical polymerization of**

macromonomers. Preparation of well defined graft copolymers

AU Hawker, Craig J.; Mecerreyes, David; Elce, Edmund; Dao, Julian; Hedrick, James L.; Barakat, Ibrahim; Dubois, Philippe; Jerome, Robert; Volksen, illi

CS NSF Center Polymeric Interfaces Macromolecular Assemblies, IBM Research Division, San Jose, CA, 95120, USA

SO Macromol. Chem. Phys. (1997), 198(1), 155-166

CODEN: MCHPES; ISSN: 1022-1352

PB Huethig & Wepf

DT Journal

LA English

CC 35-8 (Chemistry of Synthetic High Polymers)

AB Well defined graft copolymers have been synthesized by a nitroxide-mediated **living free radical** process using preformed **macromonomers**. Anal. of the graft systems revealed that the **macromonomer** was efficiently incorporated into the polymeric backbone to give **block** copolymers of controlled mol. wt. and narrow polydispersities. An added benefit of the **living free radical** process is that **macromonomers**, such as polylactide or polycaprolactone, which contain reactive functional groups can be used to form novel graft systems using this approach. Functionalized monomers or polymeric initiators were also used in the copolymer. mixt. to give graft systems with a variety of functional groups attached to the backbone.

ST graft polymer **living radical** polymer

macromonomer; nitroxide initiator **living radical**

polymer **macromonomer**

IT Polyesters, reactions

RL: PRP (Properties); RCT (Reactant)

(polystyrene-, graft; properties of graft copolymers synthesized by a nitroxide-mediated **living free radical** process using pre-formed **macromonomers**)

IT Polymerization catalysts

(properties of graft copolymers synthesized by a nitroxide-mediated **living free radical** process using pre-formed **macromonomers**)

IT **Macromonomers**

RL: PRP (Properties); RCT (Reactant)

(properties of graft copolymers synthesized by a nitroxide-mediated **living free radical** process using pre-formed **macromonomers**)

IT **Living polymerization**

(**radical**; properties of graft copolymers synthesized by a nitroxide-mediated **living free radical** process using pre-formed **macromonomers**)

IT 154554-67-3

RL: CAT (Catalyst use); USES (Uses)

(catalyst; properties of graft copolymers synthesized by a nitroxide-mediated **living free radical** process using pre-formed **macromonomers**)

IT 9002-88-4D, Polyethylene, acrylate-terminated

RL: PRP (Properties); RCT (Reactant)

(**macromonomer**; properties of graft copolymers synthesized by nitroxide-mediated **living free radical** polymer. of)

IT 25248-42-4D, Poly(caprolactone), methacrylate-terminated 25736-86-1,

Poly(ethylene glycol) monomethacrylate 128152-19-2 157170-89-3

157481-69-1, D,L-Lactide homopolymer ester with hydroxyethyl methacrylate

RL: PRP (Properties); RCT (Reactant)

. (**macromonomer**; properties of graft copolymers synthesized by nitroxide-mediated **living free radical** polymer. using)

IT 106826-12-4P, Ethylene-styrene graft copolymer 109584-39-6P,

Oxirane-styrene graft copolymer 137567-72-7DP, hydrolyzed
 146277-01-2P, Poly(ethylene glycol) monomethacrylate-styrene graft
 copolymer 187455-14-7P, D,L-Lactide-styrene graft copolymer
 187455-15-8P, 4-Chloromethylstyrene-ethylene-styrene graft copolymer
 187455-17-0P
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (properties of graft copolymers synthesized by a nitroxide-mediated
 living free radical process using pre-formed
 macromonomers)

IT 81984-60-3
 RL: PRP (Properties); RCT (Reactant)
 (properties of graft copolymers synthesized by nitroxide-mediated
 living free radical polymn. using)

IT 137567-72-7P, Caprolactone-styrene graft copolymer 187455-16-9P
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (properties of graft copolymers synthesized by nitroxide-mediated
 living free radical polymn. using
 macromonomers)

AN 1998:666154 CAPLUS

DN 129:260874

TI Poly(vinyl ethers) as building blocks for new materials

AU Goethals, Eric J.; Reyntjens, Wouter; Lievens, Serge

CS Dep. Organic Chem., Polymer Chem. Div., Univ. Ghent, Ghent, B-9000, Belg.

SO Macromol. Symp. (1998), 132 (International Symposium on Ionic Polymerization, 1997), 57-64

CODEN: MSYMEC; ISSN: 1022-1360

PB Wiley-VCH Verlag GmbH

DT Journal; General Review

LA English

CC 35-0 (Chemistry of Synthetic High Polymers)

AB A review with 9 refs. on the authors' own work. The **living cationic** polymn. of vinyl ethers was used to prep. a no. of new polymers with special properties. Sequential polymn. of the hydrophilic Me vinyl ether (MVE) and the hydrophobic octadecyl vinyl ether (ODVE) has lead to amphiphilic **block** copolymers with emulsifying properties for water/decane mixts. Poly(vinyl ether) **macromonomers** were obtained by end-capping of living polymers with hydroxyethyl acrylate. Copolymn. of polyODVE **macromonomer** with usual acrylates lead to highly branched hydrophobic polymers. When the end-capping was performed with bifunctionally living polymers, the corresponding bis-**macromonomers** were obtained. Copolymn. of such bis-**macromonomers** with styrene or Bu acrylate, leads to the formation of segmented polymer networks. In the case of polyODVE-poly(Bu acrylate), these networks showed a pronounced phase sepn. Due to the crystallinity of the polyODVE domains, these materials showed shape memory properties.

ST polyvinyl ether **macromonomer block** polymn review

IT Vinyl polymers

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(ether; prepn. of poly(vinyl ethers) and use as **macromonomer**
for **block** polymers)

IT Vinyl ethers

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(polymers; prepn. of poly(vinyl ethers) and use as **macromonomer**
for **block** polymers)

IT **Macromonomers**

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP
(Preparation)
(prepn. of poly(vinyl ethers) and use as **macromonomer** for
block polymers)

IT 107-25-5DP, Methyl vinyl ether, polymers 109-53-5DP, Isobutyl vinyl ether, polymers 930-02-9DP, Octadecyl vinyl ether, polymers

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP
(Preparation)

(prepn. of poly(vinyl ethers) and use as **macromonomer** for
block polymers)

L10 ANSWER 14 OF 39 CAPLUS COPYRIGHT 2001 ACS
 AN 1999:558868 CAPLUS
 DN 132:194729
 TI Atom transfer radical polymerization of poly(vinyl ether)
macromonomers
 AU Minoda, Masahiko; Yamada, Kenji; Miyazaki, Masayuki; Endo, Masaki; Ohno, Kohji; Fukuda, Takeshi
 CS Institute for Chemical Research, Kyoto University, Kyoto, 611-0011, Japan
 SO Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.) (1999), 40(2), 399-400
 CODEN: ACPPAY; ISSN: 0032-3934
 PB American Chemical Society, Division of Polymer Chemistry
 DT Journal
 LA English
 CC 35-4 (Chemistry of Synthetic High Polymers)
 AB The present paper focuses on the atom transfer radical polymn. (**ATRP**) of vinyl ether (VE)-based **macromonomers** with a methacryloyl group at the chain end. **Living cationic** polymn. of iso-Bu VE (IBVE) initiated with the HCl adduct of a VE carrying a pendant methacryloyl group in conjunction with ZnI₂ yielded the **macromonomer** (MA-PIBVE) with a narrow mol. wt. distribution (MWD) (Mw/Mn < 1.1). The **ATRP** of MA-PIBVE was carried out using a halide initiator and the CuBr/4,4'-di-n-heptyl-2,2'-bipyridine catalytic system. The no.-av. mol. wt. of the polymacromonomer increased in proportion to the monomer conversion, while the MWDs stayed fairly narrow (Mw/Mn ~ 1.2). Thus polymacromonomers with controlled chain lengths for both the backbone and the side chain have been synthesized for the first time through a combination of **living cationic** polymn. and **ATRP** techniques. The **ATRP** of the **macromonomer** having a **block** copolymer structure was also investigated.

ST atom transfer radical polymn vinyl ether **macromonomer**
 IT Molecular weight
 Molecular weight distribution
 (atom transfer radical polymn. of poly(vinyl ether)
macromonomers and their mol. wt. characteristics)
 IT **Macromonomers**
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (atom transfer radical polymn. of poly(vinyl ether)
macromonomers and their mol. wt. characteristics)
 IT Polymerization
 (atom transfer, radical; atom transfer radical polymn. of poly(vinyl ether) **macromonomers** and their mol. wt. characteristics)
 IT Polymerization catalysts
 (radical, atom-transfer; atom transfer radical polymn. of poly(vinyl ether) **macromonomers** and their mol. wt. characteristics)
 IT 9003-44-5P, Isobutyl vinyl ether homopolymer
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (2-(1-Chloroethoxy)ethyl methacrylate-functionalized; atom transfer radical polymn. of poly(vinyl ether) **macromonomers** and their mol. wt. characteristics)
 IT 600-00-0, Ethyl-2-bromoisobutyrate 7787-70-4, Copper bromide (CuBr) 71071-44-8, 4,4'-Di-n-heptyl-2,2'-bipyridine
 RL: CAT (Catalyst use); USES (Uses)
 (atom transfer radical polymn. of poly(vinyl ether)
macromonomers and their mol. wt. characteristics)
 IT 600-00-0DP, reaction products with poly(vinyl ether) 9003-44-5DP, methacryloyl-endcapped, bromine-terminated 170713-14-1P
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (atom transfer radical polymn. of poly(vinyl ether)
macromonomers and their mol. wt. characteristics)
 IT 109-53-5, Isobutyl vinyl ether 153472-39-0 170713-12-9
 RL: RCT (Reactant)
 (atom transfer radical polymn. of poly(vinyl ether)
macromonomers and their mol. wt. characteristics)

RE.CNT 14
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(14) Yamada, K; Macromolecules 1999, V32, P290 CAPLUS

L10 ANSWER 33 OF 39 CAPLUS COPYRIGHT 2001 ACS
AN 1995:653050 CAPLUS
DN 123:33754
TI Narrow Polydispersity **Block** Copolymers by Free-Radical
Polymerization in the Presence of **Macromonomers**
AU Krstina, Julia; Moad, Graeme; Rizzardo, Ezio; Winzor, Catherine L.; Berge,
Charles T.; Fryd, Michael
CS Division of Chemicals and Polymers, CSIRO, Clayton, 3169, Australia
SO Macromolecules (1995), 28(15), 5381-5
CODEN: MAMOBX; ISSN: 0024-9297
DT Journal
LA English
CC 35-4 (Chemistry of Synthetic High Polymers)
AB A new method for producing polymers of controlled mol. wt. and narrow
polydispersity is described. The method can also be used to prep. high
purity **block** copolymers. The procedure is based on free-radical
polymn. in the presence of **macromonomers** which react by an
addn.-fragmentation mechanism and can be considered as a new form of
living radical polymn. The chem. is illustrated through
syntheses of **block** copolymers, with polydispersity as low as
1.2, based on methacrylate monomers. The procedure is compatible with the
use of acid monomers (e.g. methacrylic acid).
ST butyl methacrylate polymn **macromonomer** narrow polydispersity;
phenyl methacrylate **macromonomer block** polymn
IT Molecular weight
(polydispersity; mechanism in radical polymn. of monomer and
macromonomer to produce **block** copolymers with narrow
polydispersity)
IT Polymerization
(radical, addn.-fragmentation; mechanism in radical polymn. of monomer
and **macromonomer** to produce **block** copolymers with
narrow polydispersity)
IT 107404-23-9P, Butyl methacrylate-methyl methacrylate **block**
copolymer 164456-79-5P, Butyl methacrylate-phenyl methacrylate
block copolymer
RL: SPN (Synthetic preparation); PREP (Preparation)
(mechanism in radical polymn. of monomer and **macromonomer** to
produce **block** copolymers with narrow polydispersity)

L1 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2001 ACS
 AN 1999:708808 CAPLUS
 DN 131:337537
 TI **Block copolymer**
 IN **Nakagawa, Yoshiki**; Fujita, Masayuki; **Kitano, Kenichi**;
 Hiiro, Tomoki; Kimura, Katsuhiko
 PA Kaneka Corp., Japan
 SO PCT Int. Appl., 70 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM C08F290-02
 CC 35-4 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 39

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9955751	A1	19991104	WO 1999-JP2273	19990428
	W: CA, CN, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 992519	A1	20000412	EP 1999-917208	19990428
	R: BE, DE, FR, GB, IT				
	JP 2000198825	A2	20000718	JP 1999-122260	19990428
PRAI	JP 1998-119291	A	19980428		
	JP 1998-147809	A	19980528		
	JP 1998-151571	A	19980601		
	JP 1998-207328	A	19980723		
	JP 1998-207329	A	19980723		
	JP 1998-234428	A	19980820		
	JP 1998-306233	A	19981028		
	JP 1998-147808	A	19980528		
	WO 1999-JP2273	W	19990428		
AB	A block copolymer which comprises any of various polymers (polyolefins, polyethers, polyesters, polysiloxanes) and a polymer formed by radical living polymn. or cationic living polymn. and can be easily produced without the need of the difficult optimization of polymn. conditions, etc. The block copolymer is produced by adding polymer with alkenyl group CH ₂ =C(R ₁) [R ₁ = H, C1-20 hydrocarbyl] to a radical living polymn. system with catalysts contg. C(Ar)(R)(X), [Ar = aryl; R = H, C hydrocarbyl; X = Cl, Br, I]; or cationic living polymn. system. with catalysts C(CO ₂ R)(R ₂)(X) [R = H, C1-20 hydrocarbyl; R ₂ = Me or Et, X = Cl, Br, I].				
ST	block copolymer polyolefin polyether polyester polysiloxane prepn catalyst; radical living polymn catalyst block copolymer prepn; cationic living polymn catalyst block copolymer prepn				
IT	Polymers, preparation				
	RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (block; prepn. and mech. properties of block copolymers of polyolefins, polyethers, polyesters, polysiloxanes by radical living polymn. or cationic living polymn.)				
IT	Polymerization				
	Polymerization catalysts (cationic, living; prepn. and mech. properties of block copolymers of polyolefins, polyethers, polyesters, polysiloxanes by radical living polymn. or cationic living polymn.)				
IT	Polymerization				
	Polymerization catalysts (living, radical; prepn. and mech. properties of block copolymers of polyolefins, polyethers, polyesters, polysiloxanes by radical living polymn. or cationic living polymn.)				
IT	934-53-2	3030-47-5	7374-80-3	7550-45-0, Titanium tetrachloride, uses	
	7758-89-6, Cuprous chloride	7787-70-4, Cuprous bromide	37275-48-2, Bipyridine		
	RL: CAT (Catalyst use); USES (Uses) (prepn. and mech. properties of block copolymers of				

polyolefins, polyethers, polyesters, polysiloxanes by radical living polymn. or cationic living polymn.)

IT 34962-76-0P 68508-49-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(prepn. and mech. properties of **block** copolymers of polyolefins, polyethers, polyesters, polysiloxanes by radical living polymn. or cationic living polymn.)

IT 107-05-1DP, Allyl chloride, reaction products with hydrogenated polyisoprene 141-32-2DP, Butyl acrylate, **block** copolymer

762-72-1DP, reaction products with polyisoprene 2916-14-5DP, Allyl chloroacetate, reaction products with polycaprolactone 9003-27-4DP, Polyisobutylene, reaction products with allyl chloride 9003-31-0DP, Polyisoprene, hydrogenated, reaction products with allyl chloride 9042-19-7P, Polypropylene glycol allyl ether 24980-41-4DP, Polycaprolactone, hydroxy-terminated, reaction products with allyl chloroacetate 50658-01-0P 109671-82-1P, Isobutylene-styrene **block** copolymer 110772-34-4P 132613-74-2P 249729-13-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn. and mech. properties of **block** copolymers of polyolefins, polyethers, polyesters, polysiloxanes by radical living polymn. or cationic living polymn.)

RE.CNT 17

RE

- (1) CPC International Inc; IT 1082761 A
- (2) CPC International Inc; CA 1109584 A CAPLUS
- (3) CPC International Inc; CA 1123537 A CAPLUS
- (4) CPC International Inc; GB 1556585 A CAPLUS
- (5) CPC International Inc; FR 2352008 A CAPLUS
- (6) CPC International Inc; FR 2352008 B CAPLUS
- (7) CPC International Inc; DE 2723905 A CAPLUS
- (8) CPC International Inc; DE 2723905 C CAPLUS
- (9) CPC International Inc; US 4104330 A CAPLUS
- (10) CPC International Inc; JP 62-34761 B2 CAPLUS
- (11) CPC International Inc; JP 47-21486 A 1972
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L10 ANSWER 33 OF 39 CAPLUS COPYRIGHT 2001 ACS
AN 1995:653050 CAPLUS
DN 123:33754
TI Narrow Polydispersity **Block** Copolymers by Free-Radical
Polymerization in the Presence of **Macromonomers**
AU Krstina, Julia; Moad, Graeme; Rizzardo, Ezio; Winzor, Catherine L.; Berge,
Charles T.; Fryd, Michael
CS Division of Chemicals and Polymers, CSIRO, Clayton, 3169, Australia
SO Macromolecules (1995), 28(15), 5381-5
CODEN: MAMOBX; ISSN: 0024-9297
DT Journal
LA English
CC 35-4 (Chemistry of Synthetic High Polymers)
AB A new method for producing polymers of controlled mol. wt. and narrow
polydispersity is described. The method can also be used to prep. high
purity **block** copolymers. The procedure is based on free-radical
polymn. in the presence of **macromonomers** which react by an
addn.-fragmentation mechanism and can be considered as a new form of
living radical polymn. The chem. is illustrated through
syntheses of **block** copolymers, with polydispersity as low as
1.2, based on methacrylate monomers. The procedure is compatible with the
use of acid monomers (e.g. methacrylic acid).
ST butyl methacrylate polymn **macromonomer** narrow polydispersity;
phenyl methacrylate **macromonomer block** polymn
IT Molecular weight
(polydispersity; mechanism in radical polymn. of monomer and
macromonomer to produce **block** copolymers with narrow
polydispersity)
IT Polymerization
(radical, addn.-fragmentation; mechanism in radical polymn. of monomer
and **macromonomer** to produce **block** copolymers with
narrow polydispersity)
IT 107404-23-9P, Butyl methacrylate-methyl methacrylate **block**
copolymer 164456-79-5P, Butyl methacrylate-phenyl methacrylate
block copolymer
RL: SPN (Synthetic preparation); PREP (Preparation)
(mechanism in radical polymn. of monomer and **macromonomer** to
produce **block** copolymers with narrow polydispersity)

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LI0 ANSWER 29 OF 39 CAPLUS COPYRIGHT 2001 ACS

AN 1997:51149 CAPLUS

DN 126:186508

TI **Living free radical polymerization of**

macromonomers. Preparation of well defined graft copolymers

AU Hawker, Craig J.; Mecerreyes, David; Elce, Edmund; Dao, Julian; Hedrick, James L.; Barakat, Ibrahim; Dubois, Philippe; Jerome, Robert; Volksen, illi

CS NSF Center Polymeric Interfaces Macromolecular Assemblies, IBM Research Division, San Jose, CA, 95120, USA

SO Macromol. Chem. Phys. (1997), 198(1), 155-166

CODEN: MCHPES; ISSN: 1022-1352

PB Huethig & Wepf

DT Journal

LA English

CC 35-8 (Chemistry of Synthetic High Polymers)

AB Well defined graft copolymers have been synthesized by a

nitroxide-mediated **living free radical** process using

preformed **macromonomers**. Anal. of the graft systems revealed

that the **macromonomer** was efficiently incorporated into the

polymeric backbone to give **block** copolymers of controlled mol.

wt. and narrow polydispersities. An added benefit of the **living**

free radical process is that **macromonomers**, such as

polylactide or polycaprolactone, which contain reactive functional groups

can be used to form novel graft systems using this approach.

Functionalized monomers or polymeric initiators were also used in the

copolymer. mixt. to give graft systems with a variety of functional groups

attached to the backbone.

ST graft polymer **living radical** polymer

macromonomer; nitroxide initiator **living radical**

polymer **macromonomer**

IT Polyesters, reactions

RL: PRP (Properties); RCT (Reactant)

(polystyrene-, graft; properties of graft copolymers synthesized by a

nitroxide-mediated **living free radical** process

using pre-formed **macromonomers**)

IT Polymerization catalysts

(properties of graft copolymers synthesized by a nitroxide-mediated

living free radical process using pre-formed

macromonomers)

IT **Macromonomers**

RL: PRP (Properties); RCT (Reactant)

(properties of graft copolymers synthesized by a nitroxide-mediated

living free radical process using pre-formed

macromonomers)

IT **Living polymerization**

(**radical**; properties of graft copolymers synthesized by a

nitroxide-mediated **living free radical** process

using pre-formed **macromonomers**)

IT 154554-67-3

RL: CAT (Catalyst use); USES (Uses)

(catalyst; properties of graft copolymers synthesized by a

nitroxide-mediated **living free radical** process

using pre-formed **macromonomers**)

IT 9002-88-4D, Polyethylene, acrylate-terminated

RL: PRP (Properties); RCT (Reactant)

(**macromonomer**; properties of graft copolymers synthesized by

nitroxide-mediated **living free radical** polymer. of)

IT 25248-42-4D, Poly(caprolactone), methacrylate-terminated 25736-86-1,

Poly(ethylene glycol) monomethacrylate 128152-19-2 157170-89-3

157481-69-1, D,L-Lactide homopolymer ester with hydroxyethyl methacrylate

RL: PRP (Properties); RCT (Reactant)

(**macromonomer**; properties of graft copolymers synthesized by

nitroxide-mediated **living free radical** polymer.

using)

IT 106826-12-4P, Ethylene-styrene graft copolymer 109584-39-6P,

102
NE

Oxirane-styrene graft copolymer 137567-72-7DP, hydrolyzed
146277-01-2P, Poly(ethylene glycol) monomethacrylate-styrene graft
copolymer 187455-14-7P, D,L-Lactide-styrene graft copolymer
187455-15-8P, 4-Chloromethylstyrene-ethylene-styrene graft copolymer
187455-17-0P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(properties of graft copolymers synthesized by a nitroxide-mediated
living free radical process using pre-formed
macromonomers)

IT 81984-60-3

RL: PRP (Properties); RCT (Reactant)
(properties of graft copolymers synthesized by nitroxide-mediated
living free radical polymn. using)

IT 137567-72-7P, Caprolactone-styrene graft copolymer 187455-16-9P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(properties of graft copolymers synthesized by nitroxide-mediated
living free radical polymn. using
macromonomers)

L3 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2001 ACS
 AN 1998:814226 CAPLUS
 DN 130:154029
 TI Atom Transfer Radical Polymerization of Poly(vinyl ether) Macromonomers
 AU Yamada, Kenji; Miyazaki, Masayuki; Ohno, Kohji; Fukuda, Takeshi;
Minoda, Masahiko
 CS Institute for Chemical Research, Kyoto University, Uji Kyoto, 611, Japan
 SO Macromolecules (1999), 32(2), 290-293
 CODEN: MAMOBX; ISSN: 0024-9297
 PB American Chemical Society
 DT Journal
 LA English
 CC 35-4 (Chemistry of Synthetic High Polymers)
 AB The atom transfer radical polymn. (ATRP) of vinyl ether
 (VE)-based macromonomers with a methacryloyl group at the chain end is
 studied. Living cationic polymn. of iso-Bu vinyl ether (IBVE) initiated
 with the HCl adduct of a VE carrying a pendant methacryloyl group in
 conjunction with ZnI₂ yielded the macromonomer (MA-PIBVE) with a narrow
 mol. wt. distribution (MWD) (.hivin.Mw/.hivin.Mn < 1.1). The ATRP
 of MA-PIBVE was carried out using a halide initiator and the
 CuBr/4,4'-di-n-heptyl-2,2'-bipyridine catalytic system. The no.-av. mol.
 wt. of the polymacromonomer increased in proportion to the monomer
 conversion, while the MWDs stayed fairly narrow (.hivin.Mw/.hivin.Mn
 .apprx. 1.2). Thus a novel type of polymacromonomers with controlled
 chain lengths for both the backbone and the side chain have been
 synthesized through a combination of living cationic polymn. and
 ATRP techniques.
 ST macromonomer isobutyl vinyl ether polymn; cationic living polymn isobutyl
 vinyl ether; atom transfer radical polymn macromonomer
 IT Polymerization
 (atom transfer radical; combined use of living cationic polymn. and
 atom transfer radical polymn. in synthesis of iso-Bu vinyl ether-based
 macromonomers and their well-defined polymacromonomers)
 IT Living polymerization
 (cationic; combined use of living cationic polymn. and atom transfer
 radical polymn. in synthesis of iso-Bu vinyl ether-based macromonomers
 and their well-defined polymacromonomers)
 IT Macromonomers
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic
 preparation); PREP (Preparation); PROC (Process)
 (in combined use of living cationic polymn. and atom transfer radical
 polymn. in synthesis of iso-Bu vinyl ether-based macromonomers and
 their well-defined polymacromonomers)
 IT Cationic polymerization
 (living; combined use of living cationic polymn. and atom transfer
 radical polymn. in synthesis of iso-Bu vinyl ether-based macromonomers
 and their well-defined polymacromonomers)
 IT 9003-44-5DP, Isobutyl vinyl ether homopolymer, methacryloyl-terminated,
 polymers
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (combined use of living cationic polymn. and atom transfer radical
 polymn. in synthesis of iso-Bu vinyl ether-based macromonomers and
 their well-defined polymacromonomers)
 IT 153472-39-0
 RL: CAT (Catalyst use); USES (Uses)
 (polymn. catalyst; combined use of living cationic polymn. and atom
 transfer radical polymn. in synthesis of iso-Bu vinyl ether-based
 macromonomers and their well-defined polymacromonomers)
 IT 10139-47-6, Zinc iodide 11129-27-4, Copper bromide 71071-44-8,
 4,4'-Di-n-heptyl-2,2'-bipyridine
 RL: CAT (Catalyst use); USES (Uses)
 (polymn. catalyst; in combined use of living cationic polymn. and atom
 transfer radical polymn. in synthesis of iso-Bu vinyl ether-based
 macromonomers and their well-defined polymacromonomers)
 RE.CNT 60
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